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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/522,689

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Arto Palin

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EXAMINER

PEREZ, JAMES M

ART UNIT

PAPER NUMBER

2609

MAIL DATE

DELIVERY MODE

08/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/522,689

Applicant(s)

PALIN ET AL.

Examiner

James Perez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Action

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Objection

The title of this application should contain more specific language, which more explicitly conveys the main idea of the claimed invention.

Claim Rejections - 35 USC § 112

2. Claim 18 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 18 recites the limitation "a transmitter according to claim 18" in the 1st paragraph of the claim. There is insufficient antecedent basis for this limitation in the claim. Therefore the examiner will interpret claim 18 to be dependent on claim 17.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-16,19,and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki JP 2001-060934 in view of Applicant's Admitted Prior Art.

Note: a machine translated document is enclosed for Hiroaki JP 2001-060934.

With regards to claims 1, Hiroaki teaches a method for communicating digital data using an orthogonal frequency division multiplexing (OFDM) transmission system including at least one transmitter (**fig. 1: elements 101-106**) and receivers (**see below**), the method comprising the steps of: selecting a mode of operation in a transmitter among at least one mode (**see below**) each mode of operation being associated with a number of active carriers for payload data transmission (**see below**); selecting a symbol interleaver (**fig. 1: element 102-104: paragraph 35**) in the transmitter from a set (**fig. 1: elements 102-103**) of symbol interleavers for symbol interleaving in said selected mode of operation (**fig. 1: element 103-104: the symbol interleavers inherently interleaves in the selected operating mode**); applying symbol interleaving in the transmitter on blocks of data units (**fig. 1: elements 103-104**); mapping the interleaved data units

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onto the active carriers of said selected mode of operation (**fig. 1: element 105**); receiving the interleaved data units in the receiver (**fig. 1: input to element 107**); recognizing in the receiver the symbol interleaver used in the data transmission (**fig. 1: element 110: note that the system inherently recognizes which symbol interleaver was used by the transmitter**); selecting a de-interleaver in the receiver to correspond to the recognized symbol interleaver (**fig. 1: element 110**), and de-interleaving in the receiver the received data units using the selected de-interleaver (**fig. 1: elements 108-110: output of element 110 is a de-interleaved signal which used the selected de-interleaver**).

Hiroaki remains silent with respect to teaching multiple receivers, and the step of selecting a mode of operation in a transmitter among at least one mode each mode of operation being associated with a number of active carriers for payload data transmission.

Applicant's Admitted Prior Art teaches a plurality of receivers (**paragraph 2: plurality of DVB-T receivers**) and the step of selecting a mode of operation in a transmitter among at least one mode (**paragraph 6**) each mode of operation being associated with a predetermined number of active carriers for payload data transmission or reception in a plurality of receiver (**paragraph 6**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transmission and receiving system for more effectively transmitting high rate digital data across a channel

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which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 2, the Applicant's Admitted Prior Art further teaches a method according to claim 1, wherein the number of data units (**paragraph 7: note that a data word is a group of multiple bits, therefore a data word is a data unit**) in the block (**paragraph 7: group**) onto which the symbol interleaving is applied differs from the number of the active carriers in said selected mode (**paragraph 7: In 2K mode the number of data units is 126, and the disclosed number of active carriers is 1512; similar math can be done for 8K mode**).

With regards to claim 3, the Applicant's Admitted Prior Art further teaches a method according to claim 2, wherein the number of data units (**paragraph 7: data words**) in the block (**paragraph 7: group**) and the number of active carriers in said selected mode are integer multiples of each other (**paragraph 7**).

With regards to claim 4, the Applicant's Admitted Prior Art further teaches a method according to claim 3, wherein the number of data units in the block and the number of active carriers in said selected mode are even integer multiples of each other (**paragraph 7**).

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With regards to claim 5, the Applicant's Admitted Prior Art further teaches a method according to claim 2, wherein the number of data units in the block is larger than the number of active carriers (**paragraph 7**).

With regards to claim 6, the Applicant's Admitted Prior Art further teaches a method according to claim 5, wherein the number of data units in the block is two or a multiple of two times the number of active carriers (**paragraph 7: note that in 2K mode, the a data word holds at least 2 bits, and since a bit is also a data unit, because it is an entity which holds data, the number of possible data unit bits is at least twice that of the number of active carriers**).

With regards to claim 7, the Applicant's Admitted Prior Art further teaches a method according to claim 2, wherein the number of data units in the block is smaller than the number of active carriers (**paragraph 7: note that in 2K mode, the number of data words, which is a type of data unit, is smaller than the number of active carriers**).

With regards to claim 8, the Applicant's Admitted Prior Art further teaches a method according to claim 7, wherein the number of active carriers is two or a multiple of two times the number of data units in the block (**paragraph 7**).

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With regards to claim 9, Hiroaki further teaches a method according to claim 1, wherein the selection of the symbol interleaver for symbol interleaving in the selected mode of operation is based on a desired depth of interleaving (**fig. 1: elements 101-104: paragraph 35: the controller inherently selects the desired symbol interleaver based on the desired depth**).

With regards to claim 10, the Applicant's Admitted Prior Art further teaches a method according to claim 1, wherein the set of symbol interleavers comprises at least an 8K mode symbol interleaver (**paragraphs 6-7**) and a 2K mode symbol interleaver (**paragraphs 6-7**) and at least a 4K mode of operation (**paragraphs 8-9**) is selectable for a DVB-T (Digital Video Broadcasting-Terrestrial) system (**paragraphs 6-9**).


With regards to claim 11, the Applicant's Admitted Prior Art further teaches a method according to claim 1, wherein the set of symbol interleavers comprises at least an 8K mode symbol interleaver and at least a 2K mode of operation is selectable for a DVB-T system (**paragraphs 6-7**).

With regards to claim 12, the Applicant's Admitted Prior Art further teaches a method according to claim 1, wherein the data units are data units of one or more OFDM-symbols (**paragraph 6**).

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With regards to claim 13, the Applicant's Admitted Prior Art further teaches a method according to claim 1, wherein the digital data communication system is one of the following: a DVB-T (Digital Video Broadcasting-Terrestrial) system (**paragraphs 2 and 6**), an ISDB-T (Integrated Services Digital Broadcasting-Terrestrial) system.

With regards to claim 14, the Applicant's Admitted Prior Art further teaches a method according to claim 2, wherein the data units form part of one of the following: a broadband digital television transmission (**paragraphs 2 and 6**), a datacasting transmission.

 With regards to claim 15, Hiroaki teaches the limitations of claim 15 as disclosed in Claim 1, ~~except that Hiroaki remains silent with respect to, except that~~ Hiroaki remains silent with respect to each mode of operation in the transmitter being associated with a predetermined number of active carriers used for transition of the payload data.

Applicant's Admitted Prior Art teaches a plurality of receivers (**paragraph 2: plurality of DVB-T receivers**) and the step of selecting a mode of operation in a transmitter among at least one mode (**paragraph 6**) each mode of operation being associated with a predetermined number of active carriers for payload data transmission (**paragraph 6**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted

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Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 16, the Applicant's Admitted Prior Art further teaches a transmitter according to claim 15, wherein said set of symbol interleavers form part of an inner interleaver of the transmitter (**paragraph 5**).

With regards to claim 19, Hiroaki teaches the limitations of claim 19 as disclosed in Claim 1, except that Hiroaki remains silent with respect to each mode of operation in the plurality of receivers, each being associated with a predetermined number of active carriers used for transition of the payload data.

Applicant's Admitted Prior Art teaches a plurality of receivers (**paragraph 2: plurality of DVB-T receivers**) and the step of selecting a mode of operation in a transmitter among at least one mode (**paragraph 6**) each mode of operation being associated with a predetermined number of active carriers for payload data transmission or reception in a plurality of receiver (**paragraph 6**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel

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which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 24, Hiroaki teaches the limitations of claim 19 as disclosed in Claim 1, except that Hiroaki remains silent with respect to each mode of operation in the plurality of receivers, each being associated with a predetermined number of active carriers used for transition of the payload data.

Applicant's Admitted Prior Art teaches a plurality of receivers (**paragraph 2: plurality of DVB-T receivers**) and the step of selecting a mode of operation in a transmitter among at least one mode (**paragraph 6**) each mode of operation being associated with a predetermined number of active carriers for payload data transmission or reception in a plurality of receiver (**paragraph 6**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 25, the Applicant's Admitted Prior Art further teaches a system according to claim 24, wherein the ratio between the number of

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the active carriers in the different modes of operation is an integer number (**paragraphs 6-7: the ratio of active carriers between 8K (6048) and 2K (1512) modes of operation is 4**).

With regards to claim 26, the Applicant's Admitted Prior Art further teaches a system according to claim 24, wherein the ratio between the number of the active carriers in the different modes of operation is two or a multiple of two (**paragraphs 6-7: the ratio of active carrier between 8K (6048) and 2K (1512) modes of operation is 4**).

With regards to claim 27, Hiroaki further teaches a system according to claim 24, wherein the number of symbol interleavers in the set of symbol interleavers is smaller than the number of the modes of operation of the system (**fig. 1: elements 102-103: paragraph 35: note that in the situation where no symbol interleavers but some other type of interleaver is used for both elements 102-103, the disclosed invention would have at least one mode of operation and would not have any symbol interleavers**).

6. Claims 17-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki JP 2001-060934 in view of Applicant's Admitted Prior Art as respectively applied to claims 15 and 19 above, and further in view of ETSI EN 300 744 V1.4.1 (2001-01).

With regards to claims 17, Hiroaki in view of the Applicant's Admitted Prior Art teaches a transmitter according to claim 15. Hiroaki in view of the Applicant's Admitted Prior Art are silent with respect to teaching a transmission system wherein the transmitter is arranged to transmit information indicative of said selected symbol interleaver to an OFDM receiver.

ETSI EN 300 744 V1.4.1 teaches a transmission system wherein the transmitter is arranged to transmit information indicative of said selected symbol interleaver to an OFDM receiver. **See pages 30-32, table 9 and 15: TPS (Transmission Parameter Signaling) bits inherently disclose the operating mode and in paragraph 6 of the Applicant's Admitted Prior Art it was shown that the 2K symbol interleaver corresponds to the 2K operating mode and the 8K symbol interleaver corresponds to the 8K operating mode, therefore the transmitter would obviously transmit information indicative of said selected symbol interleaver to an OFDM receiver.**

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki in view of Applicant's Admitted Prior Art with the teachings of ETSI EN 300 744 V1.4.1 in order to make a wireless system more marketable and therefore profitable by conforming the wireless communication of the invention to a major standard in the global community.

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With regards to claim 18, ETSI EN 300 744 V1.4.1 further teaches a transmitter according to claim 17, wherein one or more TPS bits are arranged to convey said information indicative of said selected symbol interleaver (**see claim 17**).

With regards to claims 20, Hiroaki in view of the Applicant's Admitted Prior Art teaches a receiver according to claim 19. Hiroaki in view of the Applicant's Admitted Prior Art are silent with respect to teaching a receiver system wherein the receiver is arranged to produce an output indicative derived from the receive information, which would be indicative of the used symbol interleaver.

ETSI EN 300 744 V1.4.1 teaches a receiver wherein the receiver is arranged to receive information indicative of the used symbol interleaver which would have an output. **See pages 30-32, table 9 and 15: TPS (Transmission Parameter Signaling) bits inherently disclose the operating mode and in paragraph 6 of the Applicant's Admitted Prior Art it was shown that the 2K symbol interleaver corresponds to the 2K operating mode and the 8K symbol interleaver corresponds to the 8K operating mode, therefore the receiver would obviously receive information indicative of the used symbol interleaver and that this received information would obviously have an output.**

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki in view of Applicant's Admitted Prior Art with the teachings of ETSI EN 300 744 V1.4.1 in order to make a wireless system more

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marketable and therefore profitable by conforming the wireless communication of the invention to a major standard in the global community.

With regards to claim 21, ETSI EN 300 744 V1.4.1 further teaches a receiver according to claim 19, wherein an output from the means for recognizing the symbol interleaver used in the data transmission is an information indicative of the recognized symbol interleaver (**see claim 20**).

7. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki JP 2001-060934 in view of Applicant's Admitted Prior Art as applied to claim 19 above, and further in view of Hosur 2001/0033623.

With regards to claim 22, Hiroaki in view of the Applicant's Admitted Prior Art teaches a receiver according to claim 19. Hiroaki in view of the Applicant's Admitted Prior Art is silent with respect to teaching a receiver which is one of the following: a fixed receiver; a mobile receiver.

Hosur teaches a receiver which is one of the following: a fixed receiver, a mobile receiver (**paragraphs 3-5**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki in view of Applicant's Admitted Prior Art with the teachings of Hosur in order to provide an orthogonal frequency division multiplexing wireless system with more effective resistance to fading by using two or more

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transmission antennas and the subcarrier symbols of a burst from one antenna being a transformed version of the subcarrier symbols of the corresponding burst from another antenna (**paragraphs 6-7**)

With regards to claim 23, Hiroaki in view of the Applicant's Admitted Prior Art teaches a receiver according to claim 19. Hiroaki in view of the Applicant's Admitted Prior Art is silent with respect to teaching a receiver wherein the receiver comprises means for a return channel via a cellular radio network and/or via a fixed network.

Hosur teaches a receiver wherein the receiver comprises means for a return channel via a cellular radio network and/or via a fixed network (**paragraphs 3-5: if the receiver was a mobile receiver, it would be obvious that the return channel would via a cellular radio network and/or a fixed network**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki in view of Applicant's Admitted Prior Art with the teachings of Hosur in order to provide an orthogonal frequency division multiplexing wireless system with more effective resistance to fading by using two or more transmission antennas and the subcarrier symbols of a burst from one antenna being a transformed version of the subcarrier symbols of the corresponding burst from another antenna (**paragraphs 6-7**) .

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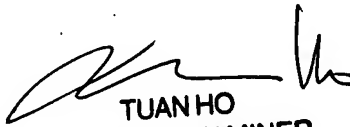
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Perez whose telephone number is (571) 270-3231. The examiner can normally be reached on Monday - Friday, 8:30am to 6pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on (571) 272-5026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP
08/14/2007


TUAN HO
PRIMARY EXAMINER